State of California Business, Transportation and Housing Agency

# Memorandum

To: Lauren Kemp
Construction Liaison
District 11 Environmental

Date: September 13, 2007
File: 11-SD-905-9.2/18.0
EA 11-274801

From: **DEPARTMENT OF TRANSPORTATION**
**DIVISION OF ENGINEERING SERVICES**
**Geotechnical Services**
**Office of Geotechnical Design - South**

Subject: Proposed Slurry Basins at 905 and Caliente Avenue

## Introduction

Pursuant to your request an investigation has been conducted of the proposed slurry basin site as shown on the attached slurry plan sheet. The basins are intended to temporarily store the slurry produced from the grinding of concrete pavement. The investigation included site reconnaissance, review of the project Geotechnical Design Report (GDR) to construct the SR-905 Freeway and other archived documents, four shallow soil borings by hand auger, and percolation testing. This report is intended to convey information relevant to the design of the proposed slurry basins. Additional pertinent data concerning the slurry basin site can be found in the SR-905 Freeway GDR.

## Site Description

In it's current condition the proposed slurry basin site is fallow farmland that gently slopes a few meters in elevation from northwest to southeast. The site is bounded on the north by existing SR-905 and on the south by broad topographic swale.

## Exploration and Testing

Numerous soil borings and extensive geologic mapping was previously completed along the SR-905 alignment during preparation of the project GDR. Four of those borings (BB4, BB5, BB6, and BB7) were located relatively close to the proposed slurry basin site and may be considered representative of the subsurface conditions underlying the proposed basins. Copies of the field boring logs are attached to this report. The locations of borings BB5 and BB6 are depicted on the attached plan sheet.

Four shallow hand auger borings (PT1 through PT4) were conducted specifically for this investigation. The location of each boring is shown on the attached slurry basin plan sheet. The

depth of the shallow borings was 1.6 meters. The depth of each boring was selected to approximate the depth of basin grading.

Percolation testing was conducted in the four shallow hand auger borings in accordance with CTM 750. The results of the percolation test are attached to this report. The following percolation rates were recorded:

| | |
|---|---|
| PT1 | 63.1 min/in |
| PT2 | 12.4 |
| PT3 | 30.2 |
| PT4 | 40.3 |

Soil gradation testing was not performed, as the site soils are formational sandstone, siltstone, and claystone.

**Site Geology**

The soil borings and geologic mapping clearly detail the subsurface conditions. A surficial layer of slightly organic clayey silt topsoil mantles the proposed slurry basin site. Soft/weak siltstone and fine grain sandstone of the Otay Formation underlie the topsoil. This flat lying sedimentary formation contains interbedded claystone and slightly indurated layers of somewhat harder formation.

**Groundwater**

No groundwater was encountered in the shallow hand auger borings conducted within the proposed slurry basin site. No Groundwter was encountered in any of the nearby borings conducted for the 905 project GDR and drilled to maximum depths of about 8.2 meters. The Department of Water Resources Bulletin 106-2 describes the general occurrence of groundwater in the area as being at depths greater than 100 feet. This generalization was confirmed by relatively deep borings conducted for bridge foundation exploration on the SR-905 project.

**Recommendations**

The site is well suited to accommodate the proposed slurry basins without the need for an impermeable basin liner. The site soils are easily rippable by heavy grading equipment. Soil percolation rates are relatively low. The prevailing geologic formation does not readily store or convey subsurface water. There are no aquifers in the project area. The proposed basins will not leach slurry into groundwater resources. Due to the hydrogeologic behavior of the surrounding sedimentary formation, an average percolation rate of roughly 44 min/in will govern basin behavior. However, the precipitation of slurry cake will quickly render the basin floor essentially impermeable.

The graded soil berms that form the sides of the proposed slurry basins will be significantly more permeable than the undisturbed native formation. To minimize seepage, the

soil berms should be placed to a relative compaction of 90% with a minimum top width of 3 meters and a side slope gradient of 1:2 (vertical to horizontal). Mild water seepage through the berms should be anticipated, however, such seepage is not necessarily problematic. Berm seepage rates may be insufficient to produce surface flow, and any concentrated seepage may be effectively managed. The basin side of the berms may be lined to reduce the seepage rate. If utilized, the impermeable liner should extend a minimum of two meters onto the floor of the basins. For optimum results seams in the lining should be minimized. Lining of the basin floors may be considered superfluous since the precipitation of slurry cake will quickly render the basin floor essentially impermeable.

The width and relative compaction of the graded soil berms may be substantially reduced if the slurry basins are constructed with a competent impermeable liner. In addition to the design of basin liners, responsible staff outside OGDS should provide the design of minimally dimensioned and compacted earth berms.

OGDS staff is available to provide further site information and recommendations. If you have additional questions or require clarification please contact Brian Hinman at (office) 858 467-4051 or (mobile) 858 705-1344.

Brian Hinman

Brian Hinman
Senior Transportation Engineer
Office of Geotechnical Design - South

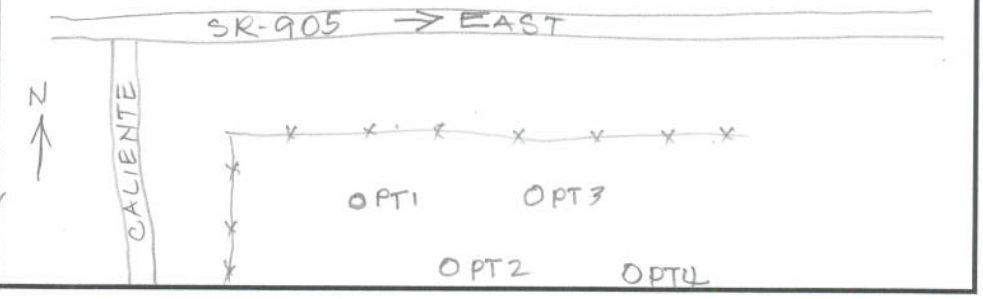

cc: Abbas Abghari
OGDS2 Files

Attachments

# PERCOLATION TEST

## GEOTECHNICAL DESIGN SOUTH-2

| PROJECT | | SITE LAYOUT/NOTES |
|---|---|---|
| EA # | | |
| DATE | 9/7/07 | |
| TEST MADE BY | ECG | |
| AMBIENT TEMP | | |
| WEATHER COND'N | SUNNY | |
| SOAKING PERIOD | 24 HRS | |
| TYPE OF SOIL | SAND & SILTST | |
| | | |
| | | |




| HOLE NO. | PT-1 | PT-2 | PT-3 | PT-4 | | | | |
|---|---|---|---|---|---|---|---|---|
| HOLE DEPTH (ft) | 5'6" | 5'1" | 5'1" | 5'2" | | | | |
| HOLE DIA. (in) | 6" | 6" | 6" | 6" | | | | |
| READING | TIME | TIME | TIME | TIME | TIME | TIME | TIME | TIME |
| 8" - 7" | 12'10" | 2'25" | 6'25" | 8'31" | | | | |
| 8" - 7" | 15'13" | 3'24" | 7'33" | 11'36" | | | | |
| 8" - 7" | 18'09" | 3'31" | 8'28" | 13'08" | | | | |
| 8" - 7" | 18'51" | 3'45" | 9'08" | 13'01" | | | | |
| 8" - 7" | 19'12" | 3'59" | 9'35" | 12'02" | | | | |
| 8" - 7" | 19'25" | 3'51" | 9'38" | 12'35" | | | | |
| | 20'19" | | | | | | | |
| | | | | | | | | |
| AVERAGE (LAST 3) = R =_____ min/in | 19'39" | 3'51" | 9'24" | 12'33" | | | | |
| | | | | | | | | |
| | | | | | | | | |
| P = | 63.1 | 12.4 | 30.2 | 40.3 | | | | |

**CALCULATION:** AVE. OF LOW RATES: $P_{AVE} \approx 44$ min/in

1) **Correction Factor ©**

$C = n[1 - (O/D)^2] + (I/D)^2 =$ 0.536111

| | | |
|---|---|---|
| Porosity of the pea gravel, | n = | 0.3 |
| Inside diameter of perforated pipe in inches, | I = | 4 |
| Outside diameter of perforated pipe in inches, | O = | 5 |
| Actual diameter of percolation test hole in inches, | D = | 6 |

2) **Conversion factor (K)**

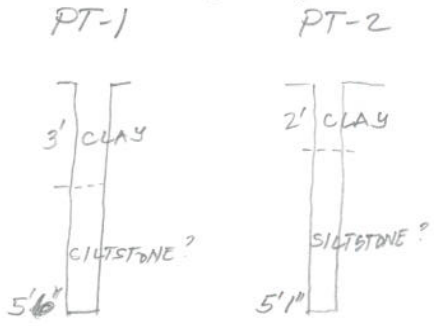
K = 0.27 + 8.7/D

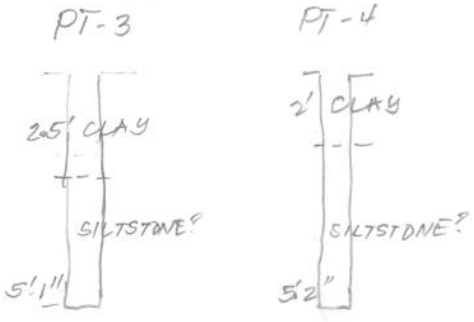
K = 1.72

3) **Equivalent Unlined 12-inch Diameter Percolation Rate (P)**

P = K.R/C

**P = _____ min/in** 0



State of California - Department of Transportation - Office of Geotechnical Services

# SOILS AND GEOLOGICAL EXPLORATION LOG



| Boring No. | Date Started | Date Ended | Geologist & Crew | Project Name | EA |
|---|---|---|---|---|---|
| BB-4 | 4/8/2004 | 4/8/2004 | M Jandal | SR-905 | 11-091821 |

| Top Hole Elev. | Location | | Purpose of work | Dist - Co. - Rte. - PM |
|---|---|---|---|---|
| 165 m | Offset & Station 10 m Rt., 131+00 | Ref Line E-5 | GDR Investigation | 11-SD-905 |

Groundwater Level — Date Measured: | Depth to Water:

Total Hole Depth 7.60 m

| Drilling Method | Drilling Equipment |
|---|---|
| Hollow Stem Auger Drilling | Truck Mounted Rig (CS 500) |

**Lithological Descriptions**

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

| Boring Depth (ft) | Boring Depth (meter) | Sample Number | SPT | CA Modified | Coring | Total Recovery | % Recovery | RQD | Lab Work Assigned | SPT Blows per .3 meter: .15 meter | SPT Blows per .3 meter: SPT total | Graphic Log | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1–5 | 1 | | | | | | | | | | | | |
| 6–10 | 2–3 | | 15<br>20<br>31 | | | | | | | | 50+ | CL | Sandy Lean Clay, hard, dry with calcareous nodules and ferrous strains, medium plasticity (Terrace Deposit) |
| 11–15 | 4 | | 14<br>18<br>14 | | | | | | | | 32 | SM | Silty Sand, dense, yellowish brown and gray, with occasional gravel (Terrace Deposit) |
| 16–20 | 5–6 | | 12<br>28<br>40 | | | | | | | | 50+ | SW | Well Graded Sand, very dense, gray and reddish brown, with gravel, refusal, 40 blows for 2" of penetration (Terrace Deposit) |

Continued on Page 2 of 2

State of California - Department of Transportation - Office of Geotechnical Services

# SOILS AND GEOLOGICAL EXPLORATION LOG

Page 2 of 2

| Boring No. | Date Started | Date Ended | Geologist & Crew | Project Name | EA |
|---|---|---|---|---|---|
| BB-4 | 4/8/2004 | 4/8/2004 | M Jandal | SR-905 | 11-091821 |

| Top Hole Elev. | Location | | Purpose of work | Dist - Co. - Rte. - PM |
|---|---|---|---|---|
| 165 m | Offset & Station 10 m Rt., 131+00 | Ref Line E-5 | GDR Investigation | 11-SD-905 |

Groundwater Level: Date Measured — Depth to Water

Total Hole Depth 7.60 m

Drilling Method: Wet core drilling

Drilling Equipment: Truck Mounted Rig (CS 500)

**Lithological Descriptions**

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

| Boring Depth (ft) | Boring Depth (meter) | Sample Number | SPT | CA Modified | Coring | Total Recovery | % Recovery | RQD | Lab Work Assigned | SPT Blows per .3 meter: .15 meter | SPT Blows per .3 meter: SPT total | Graphic Log | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21 | 7 | | 41 | | | | | | | | 50+ | GP/SC | Sandy Gravel/Clayey Sand, very dense, gray and brown, refusal, 20 blows for 1" of penetration (Terrace Deposit) |
| 22 | | | 27 | | | | | | | | | | |
| 23 | | | 20 | | | | | | | | | | - hit a solid layer, slow drilling |
| 24 | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | - refusal, 20 blows for 1" of penetration |
| 26 | 8 | | 20 | | | | | | | | | | End of boring at 7.6 meters |
| 28 | | | | | | | | | | | | | Ground water was not encountered during the drilling operations. |
| 29 | | | | | | | | | | | | | |
| 30 | 9 | | | | | | | | | | | | |
| 31 | | | | | | | | | | | | | |
| 32 | | | | | | | | | | | | | |
| 33 | 10 | | | | | | | | | | | | |
| 34 | | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |
| 36 | | | | | | | | | | | | | |
| 37 | 11 | | | | | | | | | | | | |
| 38 | | | | | | | | | | | | | |
| 39 | | | | | | | | | | | | | |
| 40 | 12 | | | | | | | | | | | | |

State of California - Department of Transportation - Office of Geotechnical Services

# SOILS AND GEOLOGICAL EXPLORATION LOG

Page 1 of 2

| Boring No. | Date Started | Date Ended | Geologist & Crew | Project Name | EA |
|---|---|---|---|---|---|
| BB-5 | 4/8/2004 | 4/8/2004 | M Jandal | SR-905 | 11-091821 |

| Top Hole Elev. | Location | | Purpose of work | Dist - Co. - Rte. - PM |
|---|---|---|---|---|
| 165 m | Offset & Station: CtrL. 132+20 | Ref Line E5 | GDR Investigation | 11-SD-905 |

Groundwater Level — Date Measured: | Depth to Water:

Total Hole Depth:

| Drilling Method | Drilling Equipment |
|---|---|
| Hollow Stem Auger Drilling | Truck Mounted Rig (CS 500) |

**Lithological Descriptions**

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

| Boring Depth (ft) | Boring Depth (meter) | Sample Number | SPT | CA Modified | Coring | Total Recovery | % Recovery | RQD | Lab Work Assigned | SPT Blows per .3 meter: .15 meter | SPT Blows per .3 meter: SPT total | Graphic Log | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | |
| 3 | 1 | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | |
| 6 | | | 27 | | | | | | | | | SM | Silty Sand, very dense, light gray and reddish brown, slightly moist with gravel and calcareous nodules (Terrace Deposit) |
| | 2 | | 28 | | | | | | | | 50+ | | |
| | | | 23 | | | | | | | | | | - at 2 m hit a layer of gravel |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| 10 | 3 | | | | | | | | | | | | |
| 11 | | | 25 | | | | | | | | | GP | Poorly Graded Sandy Gravel, very dense, reddish brown (Terrace Deposit) |
| | | | 60 | | | | | | | | 50+ | | |
| 12 | | | 50 | | | | | | | | | | |
| 13 | 4 | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |
| 16 | | | 12 | | | | | | | | | | - refusal, 12 blows for 25 mm of penetration (the hammer was bouncing upon impact) |
| 17 | 5 | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | |
| 20 | 6 | | | | | | | | | | | | |

Continued on Page 2 of 2

State of California - Department of Transportation - Office of Geotechnical Services

# SOILS AND GEOLOGICAL EXPLORATION LOG



| Boring No. | Date Started | Date Ended | Geologist & Crew | Project Name | EA |
|---|---|---|---|---|---|
| BB-5 | 4/8/2004 | 4/8/2004 | M Jandal | SR-905 | 11-091821 |

| Top Hole Elev. | Location | | Purpose of work | Dist - Co. - Rte. - PM |
|---|---|---|---|---|
| 165 m | Offset & Station: CtrL. 131+00 | Ref Line E5 | GDR Investigation | 11-SD-905 |

Groundwater Level: Date Measured — Depth to Water

Total Hole Depth

Drilling Method: Wet core drilling

Drilling Equipment: Truck Mounted Rig (CS 500)

**Lithological Descriptions**

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

| Boring Depth (ft) | Boring Depth (meter) | Sample Number | SPT | CA Modified | Coring | Total Recovery | % Recovery | RQD | Lab Work Assigned | SPT Blows per .3 meter: .15 meter | SPT Blows per .3 meter: SPT total | Graphic Log | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21 | 7 | | 60 / 50 | | | | | | | | 50+ | SM | Gravelly Silty Sand, very dense, tan and gray, refusal, 50 blows for 75 mm of penetration (Terrace Deposit) |
| 22 | | | | | | | | | | | | | |
| 23 | | | | | | | | | | | | | End of boring at 6.4 meters |
| 24 | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | Ground water was not encountered during the drilling operations. |
| 26 | 8 | | | | | | | | | | | | |
| 28 | | | | | | | | | | | | | |
| 29 | | | | | | | | | | | | | |
| 30 | 9 | | | | | | | | | | | | |
| 31 | | | | | | | | | | | | | |
| 32 | | | | | | | | | | | | | |
| 33 | 10 | | | | | | | | | | | | |
| 34 | | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |
| 36 | | | | | | | | | | | | | |
| 37 | 11 | | | | | | | | | | | | |
| 38 | | | | | | | | | | | | | |
| 40 | 12 | | | | | | | | | | | | |

State of California - Department of Transportation - Office of Geotechnical Services

# SOILS AND GEOLOGICAL EXPLORATION LOG



| Boring No. | Date Started | Date Ended | Geologist & Crew | Project Name | EA |
|---|---|---|---|---|---|
| BB-6 | 4/7/2004 | 4/7/2004 | A. Lari | SR-905 | 11-091821 |

| Top Hole Elev. | Location | | Purpose of work | Dist - Co. - Rte. - PM |
|---|---|---|---|---|
| 160 m | Offset & Station: 10 m Rt. 134+00 | Ref Line E5 | GDR Investigation | 11-SD-905 |

Groundwater Level — Date Measured: — Depth to Water: —

Total Hole Depth: —

Drilling Method: Wet core drilling

Drilling Equipment: Truck Mounted Rig (CS 500)

**Lithological Descriptions**

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

| Boring Depth (ft) | Boring Depth (meter) | Sample Number | SPT | CA Modified | Coring | Total Recovery | % Recovery | RQD | Lab Work Assigned | SPT Blows per .3 meter: .15 meter | SPT Blows per .3 meter: SPT total | Graphic Log | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | |
| 3 | 1 | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | |
| 5 | | | 32 | | | | | | | | 50+ | CL | Sandy Clay, hard, mottled light brown and white, dry , medium plasticity (Terrace Deposit) |
| | | | 50 | | | | | | | | | | |
| 6 | | | 50 | | | | | | | | | | |
| | 2 | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| 10 | 3 | | 46 | | | | | | | | 50+ | SM | Silty Sand, very dense, mottled light brown and white, dry (Terrace Deposit) |
| | | | 50 | | | | | | | | | | |
| 11 | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | |
| 13 | 4 | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | |
| | | | 20 | | | | | | | | 50+ | | - some rock |
| 15 | | | 50 | | | | | | | | | | |
| 16 | | | | | | | | | | | | | |
| 17 | 5 | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 20 | 6 | | 9 | | | | | | | | | | Poorly Graded Sand, very dense, dark gray |
| | | | 40 | | | | | | | | | | |

Continued on Page 2 of 2

State of California - Department of Transportation - Office of Geotechnical Services

# SOILS AND GEOLOGICAL EXPLORATION LOG



| Boring No. | Date Started | Date Ended | Geologist & Crew | Project Name | EA |
|---|---|---|---|---|---|
| BB-6 | 4/7/2004 | 4/7/2004 | A. Lari | SR-905 | 11-091821 |

| Top Hole Elev. | Location | | Purpose of work | Dist - Co. - Rte. - PM |
|---|---|---|---|---|
| 160 m | Offset & Station: 10 m Rt. 134+00 | Ref Line E-5 | GDR Investigation | 11-SD-905 |

Groundwater Level — Date Measured: | Depth to Water:

Total Hole Depth:

Drilling Method: Wet core drilling

Drilling Equipment: Truck Mounted Rig (CS 500)

**Lithological Descriptions**

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

| Boring Depth (ft) | Boring Depth (meter) | Sample Number | SPT | CA Modified | Coring | Total Recovery | % Recovery | RQD | Lab Work Assigned | SPT Blows per .3 meter: .15 meter | SPT Blows per .3 meter: SPT total | Graphic Log | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21 | | | | | | | | | | | 50+ | SP | Poorly Graded Sand, very dense, dark gray (Terrace Deposit) |
| 22 | | | | | | | | | | | | | - hit rock, slow drilling |
| 23 | 7 | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | | |
| 25 | | | 30 | | | | | | | | | GW | Well Graded gravel, very dense, dark gray, refusal, 30 blows for 75 mm of penetration (Terrace Deposit) |
| 26 | | | | | | | | | | | | | |
| | 8 | | | | | | | | | | | | End of boring at 8.2 meters |
| 28 | | | | | | | | | | | | | Ground water was not encountered during the drilling operations. |
| 29 | | | | | | | | | | | | | |
| 30 | 9 | | | | | | | | | | | | |
| 31 | | | | | | | | | | | | | |
| 32 | | | | | | | | | | | | | |
| 33 | 10 | | | | | | | | | | | | |
| 34 | | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |
| 36 | | | | | | | | | | | | | |
| 37 | 11 | | | | | | | | | | | | |
| 38 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| 40 | 12 | | | | | | | | | | | | |

State of California - Department of Transportation - Office of Geotechnical Services

# SOILS AND GEOLOGICAL EXPLORATION LOG



| Boring No. | Date Started | Date Ended | Geologist & Crew | Project Name | EA |
|---|---|---|---|---|---|
| BB-7 | 4/7/2004 | 4/7/2004 | M. Jandal | SR-905 | 11-091821 |

| Top Hole Elev. | Location | | Purpose of work | Dist - Co. - Rte. - PM |
|---|---|---|---|---|
| 160 m | Offset & Station: 10 m Rt. 135+63 | Ref Line E5 | GDR Inestigation | 11-SD-905 |

Groundwater Level — Date Measured: | Depth to Water:

Drilling Method: Wet Core Drilling | Drilling Equipment: Truck Mounted Rig (CS 2000)

**Lithological Descriptions**

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

| Boring Depth (ft) | Boring Depth (meter) | Sample Number | Total Hole Depth | SPT | CA Modified | Coring | Total Recovery | % Recovery | RQD | Lab Work Assigned | SPT Blows per .3 meter: .15 meter | SPT total | Graphic Log | Lithological Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1–5 | 1 | | | | | | | | | | | | | |
| 6 | 2 | | | 15 | | | | | | | 19 | 42 | SM | Silty Sand, dense to very dense, light gray, slightly moist with gravel and fine calcareous material (Terrace Deposit) |
| 8–10 | 3 | | | 23 | | | | | | | | | | |
| 11 | 4 | | | 16 | | | | | | | 20 | 40 | | - with occasional gravel |
| 12–15 | | | | 20 | | | | | | | | | | |
| 16 | 5 | | | 26 | | | | | | | 50 | 50+ | GP | Poorly Graded Gravel, very dense, greenish gray, with oxidation stains, refusal, 50 blows for 50 mm of penetration (Terrace Deposit) |
| 17–20 | 6 | | | | | | | | | | | | | |

State of California - Department of Transportation - Office of Geotechnical Services

# SOILS AND GEOLOGICAL EXPLORATION LOG



| Boring No. | Date Started | Date Ended | Geologist & Crew | Project Name | EA |
|---|---|---|---|---|---|
| BB-7 | 4/7/2004 | 4/7/2004 | M. Jandal | SR-905 | 11-091821 |

| Top Hole Elev. | Location | | Purpose of work | Dist - Co. - Rte. - PM |
|---|---|---|---|---|
| 160 m | Offset & Station: 10 m Rt. 135+63 | Ref Line E5 | GDR Inestigation | 11-SD-905 |

Groundwater Level — Date Measured: | Depth to Water:

Total Hole Depth:

| Drilling Method | Drilling Equipment |
|---|---|
| Wet Core Drilling | Truck Mounted Rig (CS 2000) |

**Lithological Descriptions**

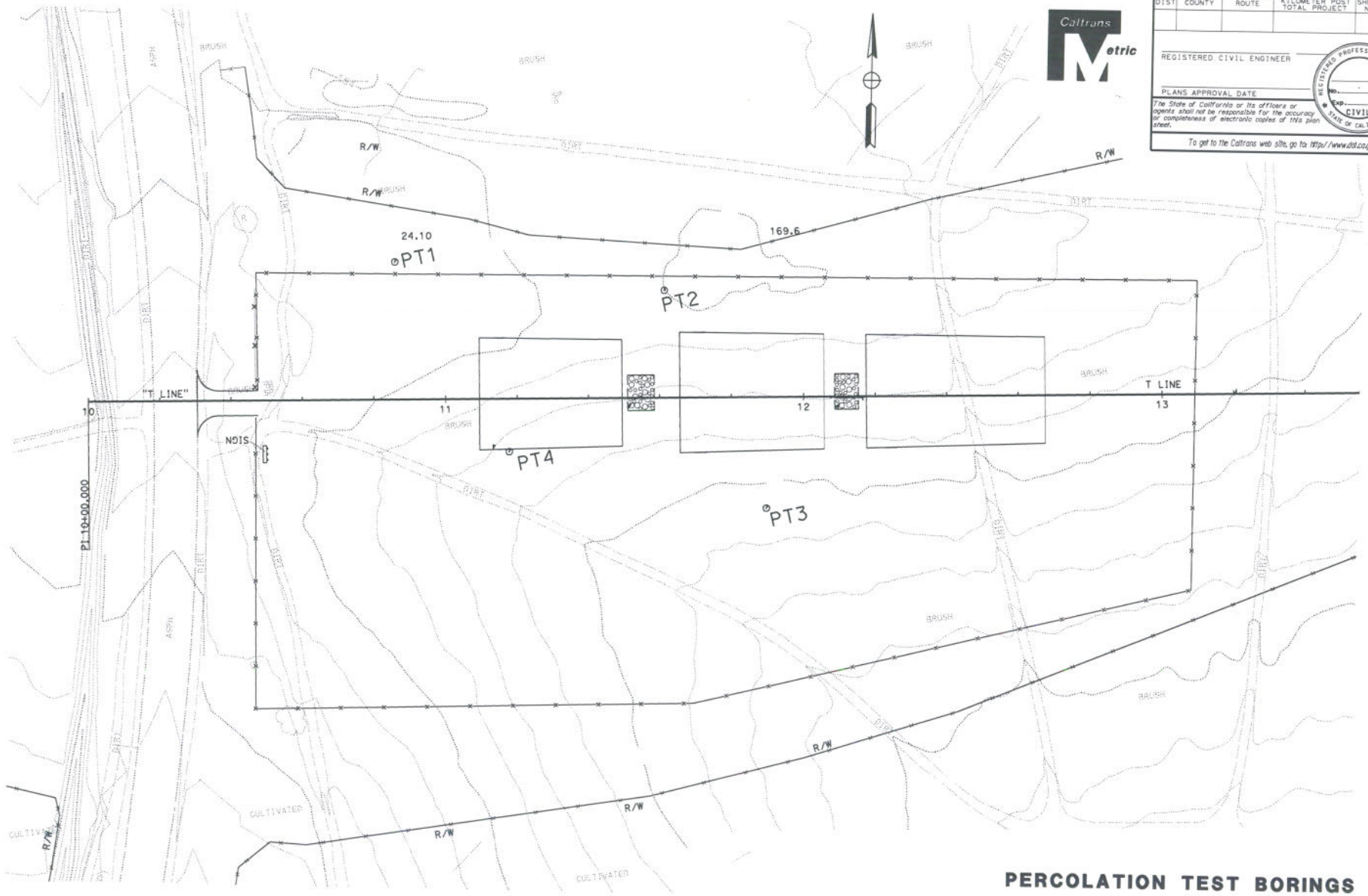
1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

| Boring Depth (ft) | Boring Depth (meter) | Sample Number | SPT | CA Modified | Coring | Total Recovery | % Recovery | RQD | Lab Work Assigned | SPT Blows per .3 meter: .15 meter | SPT total | Graphic Log |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21 | | | 50 | | | | | | | | | |
| 22 | | | | | | | | | | | | |
| 23 | 1 | | | | | | | | | | | |
| 24 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | |
| 26 | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | |
| 28 | | | | | | | | | | | | |
| 29 | | | | | | | | | | | | |
| 30 | 3 | | | | | | | | | | | |
| 31 | | | | | | | | | | | | |
| 32 | | | | | | | | | | | | |
| 33 | 4 | | | | | | | | | | | |
| 34 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | |
| 36 | | | | | | | | | | | | |
| 37 | 5 | | | | | | | | | | | |
| 38 | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | |
| 40 | 6 | | | | | | | | | | | |

Poorly Graded Gravel, very dense, greenish gray, with oxidation stains, refusal, 50 blows for 75 mm of penetration (Terrace Deposit)

End of boring at 6.3 meters

Ground water was not encountered during the drilling operations.




**PERCOLATION TEST BORINGS**

NO SCALE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans PROJECT DEVELOPMENT
PROJECT ENGINEER
CALCULATED/ DESIGNED BY
CHECKED BY
DATE REVISED BY
DATE REVISED

Caltrans Metric

| DIST | COUNTY | ROUTE | KILOMETER POST TOTAL PROJECT | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| | | | | | |

REGISTERED CIVIL ENGINEER
PLANS APPROVAL DATE
REGISTERED PROFESSIONAL ENGINEER NO. EXP. CIVIL STATE OF CALIFORNIA

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To get to the Caltrans web site, go to: http://www.dot.ca.gov

RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbamalik
DGN FILE => perc_pts&gn.dgn

CU 00000 EA 000000

LAST REVISION DATE PLOTTED => 13-SEP-2007
00-00-00 TIME PLOTTED => 15:18

D:\slurry pl\perc_pts&gn.dgn